

MODEL-BASED CONTROL SYSTEMS AND METHODS  
FOR GAS TURBINE ENGINES

ABSTRACT OF THE DISCLOSURE

[0079] A method and system of controlling a gas turbine engine is disclosed. The engine has sensors to detect one or more parameters and actuators adapted to respond to commands. The method includes receiving data from the sensors of the engine for one or more measured or sensed parameters, estimating a state of the engine by estimating one or more unmeasured or unsensed parameters using the data from the sensors and a predictive model of the engine, generating commands for the actuators based on the state using an optimization algorithm; and transmitting the commands to the engine. The system includes a state estimator adapted to estimate a state of the engine by estimating one or more unmeasured or unsensed parameters using data from the sensors of the engine for one or more measured or sensed parameters. The estimator includes a model of the engine. The system also includes a control module adapted to generate commands for the actuators based on the state. The control module includes an optimization algorithm for determining the commands.